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Manager of Public and Employee Communications: June E. Malone  
Editor: Jenalane Rowe

## NASA's Low Density Supersonic Decelerator New Launch Window Announced

NASA's Low Density Supersonic Decelerator (LDSD) has a new set of potential launch dates for its first test flight from the U.S. Navy's Pacific Missile Range Facility in Kauai, Hawaii. The new launch dates are June 28, 29, 30 and July 1 and 3. The vehicle was originally scheduled for its first test flight earlier in June but unacceptable weather conditions prohibited the launch.

"We are excited and hopeful

that this new set of dates has the wind conditions we need for launch," said Carole McLemore, LDSD mission manager in the Technology Demonstration Mission (TDM) Program Office at NASA's Marshall Space Flight Center. "The technologies that we are testing on LDSD could allow us to land much heavier payloads on Mars, and our team has worked so hard to get this vehicle ready to test. We are crossing our fingers that winds are good and

*See LDSD Launch on [page 2](#)*

## Decontamination System to Up Research on Space Station

*By Jessica Eagan*

Just like eating, drinking and even trying to wash your hair aboard the [International Space Station](#), conducting science experiments in space is not a simple task for astronauts. There are so many more factors for crews to consider than scientists on Earth have to worry about. If not contained, microgravity can turn gasses, dust, fluids and sharp objects into a floating nightmare.

Thanks to the Microgravity Science

*See [Space Station Research](#) on [page 3](#)*



*The in-orbit decontamination system inside the Microgravity Science Glovebox (MSG) will enable advances in life science research aboard the International Space Station. (NASA)*

## SLS Program Manager Todd May: 'We are Building the Next Great Ship'



Space Launch System (SLS) Program Manager Todd May, left, speaks to a crowd about NASA's next great rocket June 19 at the U.S. Space & Rocket Center. The speech was part of the "Pass the Torch" inspiration series, which features professionals from industry, academia and government speaking about their work in space, aeronautics, engineering, science research and other related fields. "We have America's next great ship," May said. "It's called the Space Launch System. And it's taking shape as we speak." (NASA/MSFC)

### LDSD Launch *Continued from page 1*

testing can take place."

For more than two years, the team had researched wind conditions and locations around the world that would be conducive to the test. Kauai was selected because research showed that this area had the proper wind conditions to carry the balloon away from populated areas and to where it needed to go over the ocean to launch the test vehicle. Wind conditions in early June were unexpected. Although there were a few days that were very close to being acceptable, none had the exact wind conditions needed to launch the balloon.

During the experimental flight test for LDSD, a large balloon about the size of three football fields will carry the saucer-shaped test vehicle from the Pacific Missile Range Facility to an altitude of about 120,000 feet. It will then be dropped and its booster rocket will quickly kick in and propel it to 180,000 feet, reaching Mach 4. Once in the very thin air high above the Pacific, the first deceleration device called a Supersonic Inflatable Aerodynamic Decelerator -- the world's largest -- will deploy, inflate and slow the vehicle.

A short time later the second deceleration device, a 30.5 meter parachute, which is the world's largest supersonic parachute and double the size of the one used on the recent Mars Science Laboratory mission, will deploy and slow the vehicle down further before landing in the ocean.

"LDSD is important because currently, NASA is using technology that dates back to the Viking program from the 1970s to decelerate payloads," said McLemore. "To be able to land humans and much heavier equipment on Mars, we will need deceleration capabilities that can slow down large payloads and survive the trip through the thin Martian atmosphere. These new drag devices are the first steps to potentially being able to do that."

NASA's Space Technology Mission Directorate funds the LDSD mission, a cooperative effort led by NASA's Jet Propulsion Laboratory. The TDM program hosted at the Marshall Center manages LDSD. NASA's Wallops Flight Facility is coordinating support with the Pacific Missile Range Facility and providing the balloon systems for the LDSD test.

Continue to follow us [here](#) and also on Twitter (@NASA\_Technology, @NASA, @NASAJPL and @NASA\_Marshall) for the latest updates on the mission.



Glovebox (MSG), those aboard the space station have safely performed science experiments since 2002 without these worries. They conducted hundreds of studies within the sealed, negative-pressured, 9-cubic-foot work area, developed by NASA's Marshall Space Flight Center and the European Space Agency. The crew members put the MSG to good use for a wide range of microgravity research, including fluid physics, combustion science, materials science, biotechnology, fundamental physics and other investigations. This helps researchers to better understand the role of gravity in basic physical and chemical interactions.

Now NASA will add even more studies to the growing list of MSG participants. With the recent installation of a decontamination system, the facility gains the capability to host an entire additional research discipline -- life science. This upgrade was designed and manufactured by Huntsville's Teledyne Brown Engineering Inc. in partnership with Marshall.

"We are really excited to be able to provide this new system that will enable astronauts aboard the space station the ability to conduct important life science research," said Lee Jordan, project manager of the MSG at Marshall. "For example, with this system, crews can conduct experiments related to non-human cell biology that we couldn't do before in the MSG. The work we do aboard the space station is so vital because it helps us discover technologies that can lead to bettering our lives on Earth."

The decontamination system was designed with crew members' safety in mind by using high-power, ultraviolet, light-emitting diodes (UV LEDs) to sanitize surfaces inside the MSG. This cleaning process takes only a matter of minutes before and after the crew conducts the experiments. The sanitation process also removes airborne contaminants -- such as biological and chemical impurities -- and cleans up spills inside the glovebox, providing optimal accommodations for cell science and life science research. It also has an exchangeable glove system that was redesigned to be better suited for these types of studies.

The system is based on the Ultraviolet Germicidal Irradiation (UVGI) method of disinfection where UV light, at sufficiently short wavelengths, is used to kill microorganisms.



*NASA astronaut Rick Mastracchio, Expedition 38 flight engineer, prepares to test the ultraviolet light decontamination hardware, which will be used for life science experiments inside the Microgravity Science Glovebox (MSG). (NASA)*

"This application of UV has been an accepted practice for disinfection since the mid-20th century," said Lee. "The DNA of the microorganism is disrupted by the UV radiation, leaving them unable to grow or reproduce. With this technology, it is possible to destroy more than 99.99 percent of all pathogens within seconds, without addition of chemicals, without harmful side effects, inexpensively, highly efficiently and absolutely reliably."

The UV LEDs incorporated in the system are manufactured by Sensor Electronic Technology Inc. of Columbia, South Carolina, and were developed in part through the Defense Advanced Research Projects Agency Compact Mid-Ultraviolet Technology program in Arlington, Virginia.

"We're pleased to be able to deliver a system that creates a safer environment to conduct life sciences research," added Jan Hess, president of Teledyne Brown Engineering Inc. "The results of these studies could lead, for example, to enhanced treatment of infectious diseases and insight into protecting the health of astronauts on long-term space missions."

The system is available to all biological payloads that operate in the MSG and are concerned about contamination from the air or other previously processed biological payloads.

# New Travel System Coming to NASA June 30

NASA will transition from the current travel system, FedTraveler.com, to Concur Government Edition (CGE) on June 30. CGE is a government-wide, Web-based, end-to-end travel management service that has consolidated and automated travel management. The result will be an end-to-end travel service on the desktop of every NASA traveler for processing their voucher, as well as supporting all phases of travel from planning to authorizations and reservations.

The NASA Marshall Space Flight Center Travel Office will host a Live Lab during July in Building 4200, Conference Room 600. During these sessions, assistance will be available for any needs a traveler, travel arranger or approver might have regarding the new travel system.

The process and key dates for travel during NASA's transition from FedTraveler to CGE are listed to the right. These dates include when to complete travel in FedTraveler, when CGE will be available for travel, and how travel needs will be addressed during the transition phase between the two systems.

If you need assistance or have questions, please contact the Marshall Travel Office at 256-544-7312 or [MSFC-TravelOffice@mail.nasa.gov](mailto:MSFC-TravelOffice@mail.nasa.gov).

## Key Dates for Travel Authorizations and Expense Reports

**June 25** - Last day to create and approve new travel authorizations in FedTraveler. FedTraveler authorizations cannot have trip return dates beyond July 30.

**June 27** - All unapproved authorizations in FedTraveler must be deleted. If documents are deleted they can be entered into CGE beginning June 30.

**June 30** - All new travel authorizations must be entered using CGE beginning this date.

**June 30** - Existing, current FedTraveler users will migrate to CGE. Expect an e-mail with information and URL to access CGE. Anyone needing to travel who hasn't migrated will need to request access through NAMS.

**June 30 - July 31** - Live Lab - Building 4200, Conference Room 600 - to assist users with hands-on travel needs.

**July 30** - Last day for amendments to existing travel authorizations in FedTraveler.

**Aug. 15** - Last day to prepare expense reports in FedTraveler.

## Space Station Research *Continued from page 3*

Rodent research studies will be some of the first experiments to put the decontamination system to work. Rodent Research Hardware and Operations Validation ([Rodent Research-1](#)) is scheduled to launch aboard the fourth commercial resupply flight of [SpaceX's](#) Dragon spacecraft.

"[This new study] adds to our research capabilities and maintains our long history of commitment to animal welfare on Earth and in space," said Ruth Globus, the project scientist for the Research Habitat at NASA's Ames Research Center. "Not only does NASA follow all federal regulations and requirements that direct the use of animals in research, NASA was the first federal agency to develop a set of ethical principles that further governs its care and use of animals in research."

The research provides a platform aboard the station for long-duration [rodent studies](#) in space that will look

at how microgravity affects these [model organisms](#), opening the door to discoveries in basic biology. These organisms can be plants, microbes or animals, which are studied and have a genetic makeup that is understood by scientists.

Researchers can apply this knowledge toward protecting human health during spaceflight and developing treatments for diseases that affect patients on Earth. With all of this life science research planned, and with the upgraded MSG, this will hopefully one day lead to the incredible advancement of how scientists look at biology in space, leading to results in the fields of human aging and disease.

*Eagan, an ASRC Federal/Analytical Services employee, supports the Office of Strategic Analysis & Communications.*



## Marshall Center Welcomes Children Participating in 'Take Our Children to Work Day'



Team members at NASA's Marshall Space Flight Center brought their children to work to participate in various activities throughout the center as a part of "Take Our Children to Work Day" on June 19. In a presentation entitled "Cool Science" by Howard Soohoo of the Chief Engineers Office, and Chris Conn of the Space Systems Department, children were able to sample marshmallows frozen in liquid nitrogen while learning about the effects of using superconductive properties and cryogenics. (NASA/MSFC/Emmett Given)

During a presentation sponsored by Sci-Quest, children discovered that science is as close as the kitchen cabinet during a presentation from the Sci-Quest Science Chef Heather Roden. Classic experiments were demonstrated -- such as this geyser of soda pop created with Mentos candy and diet soda -- teaching lessons about density, solids, liquids, gases and nutrition. (NASA/MSFC/Emmett Given)



Kevin Delany from the Arkansas Museum of Discovery demonstrates a vortex cannon as a part of his "Awesome Science" presentation in Morris Auditorium. Delaney, who has appeared on "The Tonight Show with Jimmy Fallon," also conducted other experiments as a part of Marshall's "Take Our Children to Work Day" -- such as creating elephant toothpaste and fireballs. (NASA/MSFC/Emmett Given)



# NASA on the Square



Six-year-old Owen Dean proudly displays his homemade jetpack during “NASA on the Square” June 21 in downtown Huntsville, and gives a big “thumbs up!” with, from left, Marshall Space Flight Center Director Patrick Scheuermann, Space Launch System Program Manager Todd May and Michoud Assembly Facility Deputy Director Mike Kynard. Marshall partnered with Downtown Huntsville Inc. for the event -- a center “open house” on the streets and sidewalks around the Madison County Courthouse. Thousands came downtown to enjoy the dozens of exhibits, demonstrations, bands featuring Marshall musicians, educational activities and games for all ages. (NASA/MSFC/Emmett Given)



Among the many activities was a model of the Space Launch System suspended so visitors could pose for a modern recreation of the iconic picture of Dr. Wernher von Braun, Dr. William Pickering and Dr. James A. van Allen holding America’s first satellite, Explorer I, over their heads. Smiling for the camera are, from left, Benny Jacks, Debbie Counts and her husband, Parker Counts. (NASA/MSFC/Fred Deaton)



Dr. James Spann, manager of Marshall’s Science Research Office, peers through a solar telescope as Ralph Young and Kay Campbell line up for a look on the steps of the Madison County Courthouse. (NASA/MSFC/Fred Deaton)



During one of the 14 “Chat with NASA” events, retired astronaut Robert “Hoot” Gibson talks about his five space shuttle missions and what it’s like to work in space. (NASA/MSFC/Fred Deaton)

## Obituaries

**Wilson Allen Anderson**, 88, of Huntsville, died May 30. He retired from the Marshall Center in 1981 as an aerospace engineer. He is survived by his wife, Betrice Huffstutler Anderson.

**Robert Glenn Wiley Sr.**, 89, of Lawrence County, Tennessee, died May 31. He retired from the Marshall Center in 1973 as an industrial specialist. He is survived by his wife, Virginia Hempfleng Wiley.

**Joe Eddie Pollock**, 83, of Huntsville, died June 13. He retired from the Marshall Center in 1992 as a data analyst. He is survived by his wife, Rebecca Jane Robnett Pollock.